## WHAT IS CLAIMED IS:

- 1. A Treponema pallidum fused antigen in which at least two surface antigens of Treponema pallidum are fused.
- 2. A Treponema pallidum fused antigen in which at least three surface antigens of Treponema pallidum are fused.
- 3. A Treponema pallidum fused antigen in which two to three surface antigens of Treponema pallidum are fused.
- 4. The Treponema pallidum fused antigen as claimed in Claim 1, wherein said at least two surface antigens of Treponema pallidum have a molecular weight selected from 47kDa, 17kDa and 15kDa.
- 5. The Treponema pallidum Èused antigen as claimed in Claim 2, wherein said at least three surface antigens of Treponema pallidum have a molecular weight selected from 47kDa, 17kDa and 15kDa.
- 6. The Treponema pallidum fused antigen as claimed in Claim 3, wherein said two to three surface antigens of

Treponema pallidum have a molecular weight selected from 47kDa, 17kDa and 15kDa.

The Treponema pallidum fused antigen as claimed in Claim 4, wherein said surface antigens are fused in the order of said surface antigen with a molecular weight of 47kDa, said surface antigen with a molecular weight of 17kDa, and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 47kDa, said surface antigen with a molecular weight of 15kDa, and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a Cterminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 17kDa, and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 47kDa, and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of

17kDa, said surface antigen with a molecular weight of 15kDa, and salid surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 17kDa, said surface antigen with a molecular weight of 47kDa, and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a Cterminus thereof; in the order of said surface antigen with a molecular weight of 47kDa and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 47kDa and said surface antigen with a molecular weight of 15kDa in view of the seguence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 17kDa and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a Cterminus thereof; in the order \of said surface antigen with a molecular weight of 17kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight

of 47kDa in view of the sequence from an N-terminus thereof to a \C-terminus thereof; in the order of said surface antigeh with a molecular weight of 15kDa and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a Cterminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; or in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof.

8. The Treponema pallidum fused antigen as claimed in Claim 5, wherein said surface antigens are fused in the order of said surface antigen with a molecular weight of 47kDa, said surface antigen with a molecular weight of

17kDa, and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 47kDa, said surface antigen with a molecular weight of 15kDa, and said surface antigen with a molecular weight of 17kDa in view of the sequence\from an N-terminus thereof to a Cterminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 17kDa, and said surface antigen with a molecular\weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 47kDa, and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 17kDa, said surface antigen with a molecular weight of 15kDa, and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 17kDa, said surface antigen with a molecular weight of 47kDa, and said surface antigen with a molecular \weight of 15kDa in

view of the sequence from an N-terminus thereof to a Cterminus thereof \( \) in the order of said surface antigen with a molecular weight of 47kDa and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said sunface antigen with a molecular weight of 47kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 17kDa and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a Cterminus thereof; in the order of said surface antigen with a molecular weight of 17k⊅a and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular welight of 15kDa and said surface antigen with a molecular weilght of 17kDa in view of the sequence from an N-terminus thereof to a Cterminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen

with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; or in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof.

9. The Treponema pallidum fused antigen as claimed in Claim 6, wherein said surface antigens are fused in the order of said surface antigen with a molecular weight of 47kDa, said surface antigen with a molecular weight of 17kDa, and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 47kDa, said surface antigen with a molecular weight of 15kDa, and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-

terminus the eof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 17kDa, and said surface antigen with a molecular weight of 47kDa in view of the sequence from an \N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of  $\backslash 47$ kDa, and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof \to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 17kDa, said surface antigen with a molecular weight of 15kDa, and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus (thereof; in the order of said surface antigen with a molecular weight of 17kDa, said surface antigen with a molecular weight of 47kDa, and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a Cterminus thereof; in the order of said surface antigen with a molecular weight of 47kDa and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 47kDa and said surface antigen with a molecular weight

of 15kDa in view\of the sequence from an N-terminus thereof to a C-temminus thereof; in the order of said surface antigen with a molecular weight of 17kDa and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a Cterminus thereof; in the order of said surface antigen with a molecular weight of 17kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface \antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a Cterminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with\a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an \N-terminus thereof to a C-terminus thereof; or in the order of said surface



antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof.

- 10. An assay for anti-Treponema pallidum antibodies, comprising reacting a Treponema pallidum fused antigen in which at least two surface antigens of Treponema pallidum are fused with a sample in which said antibodies are to be detected.
- 11. An assay for anti-Treponema pallidum antibodies, comprising reacting a Treponema pallidum fused antigen in which at least three surface antigens of Treponema pallidum are fused with a sample in which said antibodies are to be detected.
- 12. An assay for anti-Treponema pallidum antibodies, comprising reacting a Treponema pallidum fused
  antigen in which two to three surface antigens of
  Treponema pallidum are fused with a sample in which said
  antibodies are to be detected.
- 13. The assay for anti-Treponema pallidum antibodies as claimed in Claim 10, wherein said at least two surface antigens of Treponema pallidum have a





molecular weight selected from 47kDa,17kDa and 15kDa.

- 14. The assay for anti-Treponema pallidum antibodies as claimed in Claim 11, wherein said at least three surface antigens of Treponema pallidum have a molecular weight selected from 47kDa,17kDa and 15kDa.
- 15. The assay for anti-Treponema pallidum antibodies as claimed in Claim 12, wherein said two to three surface antigens of Treponema pallidum have a molecular weight selected from 47kDa,17kDa and 15kDa.
- antibodies as claimed in Claim 13, wherein said surface antigens are fused in the order of said surface antigen with a molecular weight of 47kDa, said surface antigen with a molecular weight of 17kDa, and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 47kDa, said surface antigen with a molecular weight of 15kDa, and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of





15kDa, said surface antigen with a molecular weight of 17kDa, and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 47kDa, and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a Cterminus thereof; in the order of said surface antigen with a molecular weight of 17kDa, said surface antigen with a molecular weight of 15kDa, and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 17kDa, said surface antigen with a molecular weight of 47kDa, and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 47kDa and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 47kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus

thereof; in the order of said surface antigen with a molecular weight of 17kDa and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof: in the order of said surface antigen with a molecular weight of 17kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antiqen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a Cterminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; or in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of

12





15kDa, said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof.

The assay for anti-Treponema pallidum antibodies as claimed in Claim 14, wherein said surface antigens are fused in the order of said surface antigen with a molecular weight of 47kDa, said surface antigen with a molecular weight of 17kDa, and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 47kDa, said surface antigen with a molecular weight of 15kDa, and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof: in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 17kDa, and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof: in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 47kDa, and said surface antigen with a molecular weight of 17kDa in

view of the sequence from an N-terminus thereof to a Cterminus thereof; in the order of said surface antigen with a molecular weight of 17kDa, said surface antigen with a molecular weight of 15kDa, and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 17kDa, said surface antigen with a molecular weight of 47kDa, and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 47kDa and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 47kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 17kDa and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antiqen with a molecular weight of 17kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a





C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a Cterminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; or in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof.

18. The assay for anti-Treponema pallidum antibodies as claimed in Claim 15, wherein said surface

antigens are fused in the order of said surface antigen with a molecular weight of 47kDa, said surface antigen with a molecular weight of 17kDa, and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 47kDa, said surface antigen with a molecular weight of 15kDa, and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antiqen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 17kDa, and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 47kDa, and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a Cterminus thereof; in the order of said surface antigen with a molecular weight of 17kDa, said surface antigen with a molecular weight of 15kDa, and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a





molecular weight of 17kDa, said surface antigen with a molecular weight of 47kDa, and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 47kDa and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 47kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 17kDa and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 17kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 47kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 17kDa in view of the sequence from an N-terminus





thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof; or in the order of said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa, said surface antigen with a molecular weight of 15kDa and said surface antigen with a molecular weight of 15kDa in view of the sequence from an N-terminus thereof to a C-terminus thereof.

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